

ABSTRACT

An active control device is disclosed comprising an array of actively controlled oscillating air jets disposed on an aircraft structure. In a preferred embodiment, the device senses parameters associated with incipient unsteady aerodynamic excitation, such as free stream gusts, shed wakes in rotor and turbomachinery flows, or oscillatory motion of trailing edge control surfaces such as ailerons. These parameters are provided as input signals to a processor. Based on the input signals, the processor generates output signals that are used to operate the air jet array in a manner counteractive to the unsteady forcing. The air jet array can be used on numerous aircraft structures, including rotor blades, wings, engine inlets, engine exhausts, blunt surfaces and nozzles.

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